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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/564,972

08/01/2006

Eitan Zait

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49443 7590 08/11/2009
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EXAMINER

FRASER, STEWART A

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

08/11/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/564,972	Applicant(s) ZAIT ET AL.	
	Examiner STEWART A. FRASER	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed 5/5/2009 for Application No. 10/564972 has been entered and fully considered.
2. Claims 1-12 are currently pending and have been fully considered.
3. The 35 U.S.C. 102(b) rejection of claim 1 presented in the office action dated 1/7/2009 is withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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6. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over ZIGER (US 2003/0157415) in view of ZAIT et al. (US 2002/0086245).

The ZIGER reference recites a method for compensating critical dimension deviations across a photomask. With respect to claim 1, ZIGER teaches (Claim 11) a method of compensating for deviations in critical dimensions of photoresist patterns in a photomask, comprising steps of generating a deviation map indicating deviation of the critical dimension from a target dimension for each of the regions in the photomask, determining an amount of actinic radiation needed to be attenuated to compensate for the critical dimension deviation from the target dimension in each of the regions of the photomask, and attenuating transmission of the actinic radiation through each of the regions in the photomask by the determined attenuation amount of actinic radiation such that the critical dimension deviation is compensated to the target dimension for each of the regions in the photomask. ZIGER further teaches (Claim 13) that the actinic radiation is attenuated by either implanting a dopant species in one or more regions of the photomask substrate, wherein the dopant species is adapted to decrease transmission of the actinic radiation through the one or more regions or (Claim 14) depositing a layer of semitransparent material in one or more regions of the photomask substrate to attenuate transmission of the actinic radiation through the one or more regions in the photomask.

The ZIGER reference recites a method for compensating critical dimension deviations across a photomask. The ZIGER reference does not appear to explicitly teach the limitations of claims 2-11 directed to the use of a pulsed laser to form elements that attenuate light. However, the ZAIT reference recites a method of manufacturing patterns on a reticle, the method comprising providing at least one of a plurality of ultra-short pulsed laser beams.

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In view of claims 2-6, ZAIT teaches [0065] a method of employing a pulsed laser wherein reverse writing is performed on a reticle blank. A reticle pattern is obtained by direct writing using pulsed laser irradiation directed at the surface opposite the coated surface of the reticle through the substrate of the reticle blank and onto the chrome coating. ZAIT discloses [0089] that while the concept of producing phase shift elements to reduce or eliminate higher order diffraction patterns is not new, it is the introduction of reverse writing in reticle blanks and using parallel writing techniques as well as direct writing of internal phase shift elements inside the substrate volume that render this particular embodiment of the present invention novel and unique. In view of claims 7-11, ZAIT teaches [0104] that with femtosecond laser technology, it is easy to modify the phase values of the inscribed elements by controlling parameters, such as laser pulse energy, speed and number of pixels, with operating software.

At the time of the invention, one of ordinary skill in the art would have been able to modify the teachings of ZIGER by applying a known technique of direct writing, as taught by ZAIT, in order to compensate for critical deviations across a photomask. ZAIT discloses [0092] that employing an ultra-short pulsed laser process provides advantages of better process control, reduced number of steps, which endangers reliability, as well as reduced sensitivity to optical aberrations. By modifying the teachings of ZIGER with the teachings of ZAIT, one of ordinary skill in the art would have been able to devise a method for compensating critical dimension deviations across a photomask with pulsed laser technology. Therefore, the claims specified in the instant application would have been obvious at the time the invention was made.

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7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over ZIGER (US 2003/0157415) in view of ZAIT et al. (US 2002/0086245) as applied to claims 1-11 above, and further in view of BORRELLI et al. (US 2002/0076655).

The ZIGER and ZAIT references used in the 35 U.S.C. 103(a) rejections above do not appear to explicitly teach the limitations of new claim 12 pertaining to the use of a femto-second pulsed laser at a repetition rate of more than 10 KHz. However, the BORRELLI reference recites an invention related to methods of writing a light-guiding structure in a bulk glass substrate. In view of claim 12, BORRELLI teaches [0046] that repetition rate of a femto-second laser can be adjusted from about 1 KHz to about 250 KHz.

At the time of the invention, one of ordinary skill in the art would have been able to modify the teachings of ZIGER and ZAIT and further include the teachings of BORRELLI in order to compensate for critical deviations across a photomask. ZAIT discloses [0092] that employing an ultra-short pulsed laser process provides advantages of better process control, reduced number of steps, which endangers reliability, as well as reduced sensitivity to optical aberrations. By modifying the teachings of ZIGER and ZAIT with the teachings of BORRELLI, one of ordinary skill in the art would have been able to devise a method for compensating critical dimension deviations across a photomask with pulsed laser technology. Therefore, the claims specified in the instant application would have been obvious at the time the invention was made.

Response to Arguments

8. Applicant's arguments, see "Remarks" pages 5-8, filed 5/5/2009, with respect to the rejection(s) of claim 1 under 35 U.S.C. 102(b) as being anticipated by ZIGER (US

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2003/0157415) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection under 35 U.S.C. 103(a) is made in view of ZIGER (US 2003/0157415) and ZAIT et al. (US 2002/0086245). In view of new claim 12, a new ground(s) of rejection under 35 U.S.C. 103(a) is made in view of ZIGER and ZAIT, and further in view of BORRELLI et al. (US 2002/0076655).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEWART A. FRASER whose telephone number is (571)270-5126. The examiner can normally be reached on Monday to Thursday 6:30 am to 3:30 pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. Rosasco/
Primary Examiner, Art Unit 1795

/Stewart A Fraser/
Examiner, Art Unit 1795